

# Manual Interpretation Land Cover Mapping Protocol



## **Purpose**

To produce a land cover map of your 15 km x 15 km GLOBE Study Site

## **Overview**

Students visually interpret what they see in natural color and false color IR prints of the Landsat TM image of their GLOBE Study Site to create a hand-made land cover map of the area. The information on these maps, including MUC level 4 classifications, will help scientists check the accuracy of satellite derived land cover maps worldwide.

## **Time**

Several class periods.

## **Level**

All

## **Frequency**

One time, but may be an iterative process as you progressively investigate more areas within your GLOBE Study Site.

## **Key Concepts**

Land Cover classes  
MUC Classification scheme

## **Skills**

*Interpreting land cover manually*

## **Materials and Tools**

512 X 512 false color IR print of your GLOBE Study Site (provided by GLOBE)  
512 X 512 natural color print of your GLOBE Study Site (provided by GLOBE)  
Topographic maps of your area  
MUC Land Cover Classification System Table LAND-P-5 and definitions in the *Appendix*  
Color photocopier (if available)  
Clear plastic sheets or blank transparencies  
Tape  
Felt-tipped markers  
*Manual Classification Tutorial* in the *Toolkit*

## **Preparation**

Review the MUC Land Cover Classification Chart, discuss and evaluate local land covers, review topographic maps, and discuss classification.

## **Prerequisites**

*Odyssey of the Eyes* and *Some Like it Hot Learning Activities*

With this method, students use *image interpretation* - they visually interpret what they see in a print of their local TM image. This method may be less accurate than others because personal interpretation is subjective. Students identify and outline areas of different land cover class. Usually, water bodies will be easiest to identify, although cloud shadows sometimes resemble lakes and ponds. Others will be harder to distinguish. For example, hardwood forests may look spectrally similar to actively growing fields. The *false color*

IR image makes bodies of water and vegetation types easier to distinguish, while other types of land cover may be easier to see on the natural color image. In areas on the images where you can not identify the type of land cover, you will need to field-check the areas using the *Qualitative* or *Quantitative Land Cover Sample Site Protocols*. Assign all land cover classes using the MUC system. For further information, see the *Manual Classification Tutorial* in the *Toolkit*.

Note: The remote sensing image you use may be a few years old. Land cover may have changed since the image was taken. What you identify on the Landsat TM image may be different than what you see in your ground assessments. In this case, students should work to determine what was on the site at the time the satellite made the image.

### Step 1: Create Your Land Cover Map

- ❑ Give students the false color IR print of the Landsat TM image of your GLOBE Study Site. Generally, each color on the IR map represents a different land cover class.

Red represents actively growing, green vegetation (bright red represents hardwoods and fields, dark red represents evergreens).

Black represents water.

Blue represents urban areas and bare soils.

- ❑ Since the original print of your area provided by GLOBE is usually approximately 25 cm x 25 cm, try to enlarge various sections of it on a color copier to several times their original size. Four or more small groups of students can work on different enlarged portions of the original scene.
- ❑ Take a sheet of clear plastic large enough to cover your image. Place the plastic on top of the image and hold it in place with tape. Mark the location of the image corners on the plastic so it can be placed back in the same position if it is removed.
- ❑ Using felt-tipped marking pens, carefully outline areas of similar land cover class. Use a different color to represent each type. Assign each type the appropriate number from the MUC Land Cover Classification Chart. See Table LAND-P-5: MUC Level 1-4. If a group cannot identify a specific area, have a group or class discussion to try to identify it. Also ask a student living near the unidentified area to make an assessment of the land cover class from the MUC system on the way to or from school (students can return to such a site later and complete the *Qualitative* or

### Quantitative Land Cover Assessment

*Protocols*). Students must be careful and specific when outlining areas and assigning classes. Start by identifying the most obvious features - usually bodies of water and urban areas - and then progress to more difficult types, such as different types of natural vegetation cover.

- ❑ Once each group has mapped their image section, combine the sections and compare results in order to identify problem areas. For instance, one group may identify an area in their section as "class 1192" (needle-leaved evergreen woodland), while a group mapping an *adjacent* section identifies their portion as "class 1222" (mixed deciduous and evergreen woodland).

### Step 2: Report your results

- ❑ Once you identify all the areas on your image, transfer all MUC identifications onto a master copy and submit them to the address given in the *Implementation Guide*.